Cambridge Assessment International Education

Cambridge IGCSE™

EMVIRONMENTAL MANAGEMENT **0680/12**

Paper 1 Theory **May/June 2022**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2022 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

© UCLES 2022

[Turn over

PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

© UCLES 2022

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	‘List rule’ guidance For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

© UCLES 2022

6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

© UCLES 2022

Question	Answer	Marks
1(a)	*any one from:* loss of habitat; water pollution; air pollution / dust; loss of (agricultural) land; erosion; noise pollution; visual pollution; loss of vegetation;	**1**
1(b)	*any two from:* employment / jobs, in mine; employment / jobs, in associated service industry; improves economy (by bringing in business); improved, infrastructure / roads / rail; use / availability of materials used locally;	**2**
1(c)	*any two from*: land has been filled; lake / pond, has been made; car park / new road has been built; (top)soil added: trees / vegetation has been planted; area has been landscaped; park created;	**2**

© UCLES 2022

Question	Answer	Marks
2(a)	shovelling / sweeping overboard / putting back in the sea; because bycatch is unwanted species caught during fishing (for target species);	**2**
2(b)(i)	*any two from:* decline of fish stocks; reduction / extinction of fish species / biodiversity; death of bycatch; alteration to food, chain / web; causing death of, birds / sharks / dolphins / turtles / predators;	**2**
2(b)(ii)	*any two from:* changing fishing practice / education; modifications to, fishing gear / net type / mesh size; reduce / ban, fishing in hotspots / closed season (create) reserves; quotas; laws / international agreements; fish farming;	**2**

Question	Answer	Marks
3(a)(i)	transport and travel;	**1**
3(a)(ii)	20 (tonnes);	**1**
3(a)(iii)	14;	**1**

© UCLES 2022

Question	Answer	Marks
3(b)	*any two from:* change to a more vegetarian diet; reduce travel in cars / use public transport / cycling / walking / car pools; insulate houses; use energy-efficient appliances; switch off devices when not in use; use electric cars; AVP;	**2**

Question	Answer	Marks
4(a)	*any two from:* life expectancy highest in north coast countries / North of Tropic of Cancer; lowest between Tropic of Cancer and Equator; majority of countries 60–70; AVP;	**2**
4(b)	*any two from:* *increase due to:* improved healthcare / medicine; improved food / food supply; improved water supply / sanitation; *decrease due to:* disease / epidemic; famine; war; climate change / climate hazards; air pollution;	**2**

© UCLES 2022

Question	Answer	Marks
5(a)(i)	*any three from:* glass jar buried in soil; organisms, walk / fall / captured into trap; tall/ smooth sides prevent organisms escaping; cover prevents rain filling it up with water / excess heat / gives shade; number of, organisms / species, counted / classified; periodic sampling;	**3**
5(a)(ii)	*any two from:* can only catch organisms that crawl / move on surface; some might fly out; can only catch small organisms (less than 10cm); organisms in the trap might eat each other; glass jar does not allow water to drain out; not representative of the whole population;	**2**
5(b)(i)	61;	**1**
5(b)(ii)	axis labels: *y*-axis: number (of organisms) AND *x*-axis: organisms plus names; linear scale for *y*-axis such that bars occupy at least half the grid; bar heights plotted correctly; bar widths consistent;	**4**

Question	Answer	Marks
6(a)(i)	5 (million tonnes of oil equivalent);	**1**
6(a)(ii)	*any two from:* renewable; reduces carbon footprint / carbon neutral; lower level of air pollution / cleaner; reduces dependency on, other energy sources / foreign oil; helps to conserve fossil fuels;	**2**

© UCLES 2022

Question	Answer	Marks
6(a)(iii)	*any one from:* production of biofuels replaces food crops; deforestation due to clearing land for biofuel crops; loss of biodiversity / monoculture; may lead to soil degradation; named pollution from processing/ production;	**1**
6(a)(iv)	observation that gasoline production / consumption is much higher than biofuels; *plus any two marks for supported conclusion:* *no:* very large increase in production required; fuel (oil) is cheap in US; familiar with use of gasolene and unlikely to swap; still produces CO_2 (when combusted); agreement needed (from all suppliers) for change to happen; *yes:* gasoline is finite resource and will, run out / become expensive; can be done with government incentive; Can be used in existing technology / vehicles;	**3**
6(b)(i)	column or row headings: (type of) vehicle, number (of vehicles); 5 categories listed correctly; 5 sets of numbers recorded correctly;	**3**
6(b)(ii)	*any four from:* people's environmental concerns / no CO2 emissions; consumer demand; competitive purchase prices / low maintenance; improvements in, range / battery technology / performance; availability of charging infrastructure; rising cost of traditional fuel sources / cheaper to run; government incentives, e.g. emissions charges, reduced road tax, scrappage schemes, free parking/ subsidies;	**4**

© UCLES 2022

Question	Answer	Marks
7(a)(i)	arable, pastoral, mixed;	**1**
7(a)(ii)	subsistence farms are for own use whereas commercial farms are for profit;	**1**
7(b)	*any two from*: salinisation; waterlogging / flooding; death of plants from under-watering / reduction in yield; soil erosion; leaching of nutrients / run-off causing eutrophication;	**2**
7(c)	*crop rotation – any two from:* planting different crops each year; reduces, pests / disease; so one crop is beneficial to the next; maintains soil fertility / soil structure; *selective breeding – any two from:* breeding plants for desired traits; pest/ disease-resistance; speed of growth; size; drought-resistance / climate tolerance;	**4**
7(d)(i)	*any two from:* no natural predators; no natural diseases; favourable environmental conditions, e.g. temperature; resistant to other methods of control; out-competed other plants;	**2**

© UCLES 2022

Question	Answer	Marks
7(d)(ii)	*any two from:* destruction of farmland; reduction in crop yield; lack of grazing land for animals; reduction in profit; cost of trying to control;	**2**
7(d)(i)	biological (control);	**1**

Question	Answer	Marks
8(a)(i)	*any one from:* damage to, buildings / homes; debris / obstruction, of, roads / transport; damage to communications networks;	**1**
8(a)(ii)	*any three from:* flood defences / higher banks / walls; raise height of bridge; build houses on stilts; land zoning; monitoring and warning systems; rescue and flood management techniques / emergency rescue teams; disaster preparation (plans, drills, emergency supplies); international aid;	**3**

© UCLES 2022

Question	Answer	Marks
8(b)(i)	*any two from:* heavy rainfall; snowmelt; land relief; saturated soil; compacted soil; deforestation; cultivation; urbanisation; tsunamis; sea level rise;	**2**
8(b)(ii)	*any four from:* warmer, seas / oceans: increases areas where cyclones can form; increases, frequency of cyclones; longer cyclone season; higher sea levels (mean bigger, storm surges / waves); stronger wind speeds / more extreme cyclones; increased rainfall; current defences not designed for stronger storms; low lying coastal communities have high population density; more people living in high-risk areas;	**4**

© UCLES 2022

Question	Answer	Marks
9(a)	*any three from:* more demand for drinking; food therefore more agriculture using water; more, productivity / industry, therefore more water used; more people using, showers / pools, therefore more water used; less availability due to more industry therefore more pollution; more waste (sewage) therefore more pollution; increased competition;	**3**
9(b)(i)	(location) 1;	**1**
9(b)(ii)	9.2;	**1**
9(b)(iii)	location 3 (no mark) has highest level of N / P / K; fertiliser contains N / P / K;	**2**
9(c)	Level 3 [5–6 marks] **A coherent response is given that develops and supports the candidate's conclusion using relevant details and examples.** Indicative content and subject-specific vocabulary are generally used precisely and accurately. Good responses are likely to present a balanced evaluation of the statement. Level 2 [3–4 marks] **Development and support of the conclusion is evident, though the response may lack some coherence and/or detail.** Irrelevant detail may be present. Indicative content and subject-specific vocabulary are used but may lack some precision and / or accuracy. Responses contain evaluation of the statement, but this may not be balanced. Level 1 [1–2 marks] **The response may be limited in development and/or support.** Contradictions and / or irrelevant detail may be present. Indicative content and subject-specific vocabulary may be limited or absent. Responses may lack structure or be in the form of a list. Evaluation may be limited or absent.	**6**

© UCLES 2022

Question	Answer	Marks
9(c)	No response or no creditable response [0 marks] *indicative content for:* Building a dam is the best way to provide a constant water supply. *agree*: can produce HEP resulting in cheap electricity prevents flooding as river is controlled secure water supply / reduces water insecurity provides habitat for fish / fish for food provides recreation (swimming / sailing / canoeing) provides irrigation provides jobs (building / maintenance) income for local people (fish / tourism / recreation) tourist attraction *disagree:* very expensive to build massive engineering undertaking requires dislocation of people flooding of property / farmland geology not always suitable susceptible to earthquake / land movement susceptible to terrorism damage to environment / habitats disruption of fish migration requires / cost of maintenance silt up reduces availability of water downstream causes cross border conflict alternative / cheaper / less disruptive ways exist	

© UCLES 2022